



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,472	02/08/2002	Erik V. Johnson	120-294	8913

34845 7590 01/16/2007  
McGUINNESS & MANARAS LLP  
125 NAGOG PARK  
ACTON, MA 01720

EXAMINER

BOUTSIKARIS, LEONIDAS

ART UNIT PAPER NUMBER

2872

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/16/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/068,472

Applicant(s)

JOHNSON ET AL.

Examiner

Leo Boutsikaris

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 7-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) of (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 5/13; 9/23/02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election without traverse of invention I in the reply filed on 12/20/06 is acknowledged. Claims 7-18 are withdrawn without prejudice.

### *Claim Objections*

Claim 5 is objected to because of the following informalities: the word "is" in line 10 should be deleted for better clarity.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Brzowski (J. of Lightwave Technology article).

Regarding claim 1, Brzowski discloses an all-optical device comprising a stack of N alternating layers of a first medium and a second medium, each medium characterized by a corresponding nonlinear Kerr coefficient,  $n_{11}$  and  $n_{12}$ , respectively, wherein said two Kerr

Art Unit: 2872

coefficients have equal absolute value and opposite signs, and wherein the two media have a linear refractive index  $n_{01}$  and  $n_{02}$ , respectively. Brzozowski teaches that in one embodiment, the stack of alternating layers is such that the medium having the higher linear index of refraction has a negative nonlinear Kerr coefficient and the medium having the lower linear index of refraction has the positive nonlinear coefficient (e.g.,  $n_{01}=1.5$ ,  $n_{11}=0.01$ ,  $n_{02}=1.52$ ,  $n_{12}=-0.01$ ), see Fig. 1, equation (1), and second paragraph in Section III.

Regarding claims 3-4, Brzozowski teaches that the transmission spectrum of a device comprising the stack of alternating layers with the properties specified above is given in Figs. 2 and 4. As it can be seen from the two Figures (in Fig. 2 more evident for  $N=1,000$ ), the optical output intensity has the claimed S-curve, with the device acting as an optical hard-limiter. The spectrum has three distinct operational ranges, with the output intensity being constant in the first and the third region, and linearly increasing in the second region (where  $I_1 = I_2/2$ ). Furthermore, Brzozowski teaches that the optical hard limiter is non-absorbing (see last sentence in second full paragraph in second column in p. 115).

Regarding claims 2, 5, it can be inferred from Brzozowski and the fact that the optical hard limiter is non-absorbing that the reflection spectrum of the device has the claimed N-curve. More specifically, since there is negligible absorption in the periodic structure, energy conservation dictates that  $I_{\text{input}} = I_{\text{trans}} + I_{\text{refl}}$ , or equivalently  $I_{\text{refl}} = I_{\text{input}} - I_{\text{trans}}$ . In the region  $[0, I_1]$ ,  $I_{\text{trans}} = 0$ , hence  $I_{\text{refl}} = I_{\text{input}}$ . In the region  $[I_1, I_2]$ ,  $I_{\text{trans}} = 2I_{\text{input}} - I_2$ , hence  $I_{\text{refl}} = I_2 - I_{\text{input}}$ . Finally, in the third region  $[I_2, \infty)$ ,  $I_{\text{trans}} = I_2$ , hence  $I_{\text{refl}} = I_{\text{input}} - I_2$ . The above translate in the reflection curve of the claimed N-type.

Art Unit: 2872

Regarding claim 6, the device comprising the structure of Fig. 1 and the transmission and reflection characteristics described above constitutes an optical logic device processing input signals having two levels and producing respective output signals.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 571-272-2308. The examiner can normally be reached on M-F, 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**LEONIDAS BOUTSIKARIS**  
**PRIMARY EXAMINER**

  
Leo Boutsikaris, Ph.D., Esq.  
Primary Patent Examiner, AU 2872  
January 3, 2006